Raub, William 2006

Dr. William Raub Oral History 2006

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Interview with Dr. William Raub
Conducted by: Dr. Carl Kupfer
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Dr. Kupfer: We're in the Conference Room at the NEI with Dr. William Raub and we're about to begin the interview, he's agreed to be here for the period of questions and answers and we appreciate it very much—thank you Bill. We're okay, we're recording: Bill thanks again very much for working your way out of a very busy schedule to come here, I really appreciate it.

Dr. Raub: My pleasure, thanks for inviting me.

Dr. Kupfer: Good. Ed sends his regrets for not being able to here but he's out in Arizona and won't be back until late May, but he did craft many of these questions and we might begin with the first one. When did your involvement with the National Eye Institute begin and how long were you here?

Dr. Raub: I joined you in 1975 as the Associate Director for Extramural Programs and I was here about 3 ½ years.

Dr. Kupfer: Okay. And since then you've moved first into Building 1 of NIH and then into the Secretary's Office. Can you just give us a quick overview?

Dr. Raub: From here I moved to become the Associate Director of NIH for Extramural Programs and then Deputy Director for Extramural Programs. I then became the general Deputy Director of the NIH, including a two-year stint during that period as the acting Director.

Dr. Kupfer: Who were you Deputy Director with? Who was the…

Dr. Raub: I was Deputy to Jim Wyngaarden.

Dr. Kupfer: Right.

Dr. Raub: I was in the extramural job when Don Fredrickson was the Director, but I went into the full general Deputy position with Jim Wyngaarden. And then after Jim left, it was about a two-year period when I served also as the acting Director until Dr. Healy came in. I was here about another 6 months after that and did a one-year sabbatical at the White House Office of Science and Technology Policy, fully planning to return to Health and Human Services (HHS) but then lured away by Bill Riley, who was then the administrator of the Environmental Protection Agency. So I did what turned out to be a three year assignment as the science advisor first to him and then to his successor, Carol Browner, as the administrator of the Environmental Protection Agency. At which point Donna Shalala was then Secretary of Health and Human Services and said why don't you come home. And so for the last 11 years I've been the science advisor to a succession of secretaries at HHS, first Secretary Shalala, then Secretary Thompson and now Secretary Leavitt. I won't complicate this any further, but in the background of those 11 years I've also had some other jobs, ranging from the Science Policy Associate Director to the Deputy Assistant Secretary for Planning and the Deputy Assistant Secretary for Public Health and Emergency Preparedness. I've been the Acting Assistant Secretary in both of those positions on a couple of occasions. But my main job over the last 11 years since rejoining the department has been as the Science Advisor in the Office of the Secretary.

Dr. Kupfer: Let me ask you a quick question that just came to my mind. I was always surprised when Jim Wyngaarden asked Ed and me to be acting Fogarty Directors, and I couldn't figure out where that idea came from because he and I never saw eye to eye on a number of things and he used to micro-manage all my travel and especially Ed's travel which I never appreciated. Did you have anything to do with that?

Dr. Raub: Yes. When he asked my advice about options and I explained not only your thorough working knowledge of international activities but your management style and your ability to focus on priorities he accepted my recommendation (chuckles).

Dr. Kupfer: I had a suspicion as soon as you made that comment. Okay, and then of course there was Healy asking me to be the acting DDIR and that was quite a responsibility for a small institute to take on.

Dr. Raub: I did that too.

Dr. Kupfer: You did that too. Well, I found both of them very, very um…

Dr. Raub: I thought you would and I thought the ideas that you had put into practice were pertinent enough that you would enjoy the challenge.

Dr. Kupfer: Ed and I had stressed quite a bit the strategic planning that was done at the Eye Institute with all the problems that we had and we both would like to hear what your involvement was first of all, and what have you felt about it through the years.

Dr. Raub: Well by coincidence the first version of the plan was nearing completion when I joined you. It was on the order three or four months after the time I joined you when the plan was actually set to be unveiled. So I can't take any credit for any of the initiative. I was involved in some of the final shaping of some of the cross-cutting chapters and I was involved in some of the roll out activities with ARVO and others. I was generally impressed with it and I must tell you that I've used examples from it over the years in other context. It was in a time when the National Cancer Institute (NCI) had given a lot of attention to a national plan for combating cancer and therefore there was a certain growing interest in various quarters in planning even though many scientists through my acquaintance really didn't want to think that anyone could possibly plan anything about research. But the Cancer Institute work, as important as it was, was planning against rapidly expanding resources. And what I found instructive in the NEI approach is while resources were expanding, it wasn't in anything like that pace and therefore it meant that much more in terms of the priority setting and some of the choices that had to be made. I thought you and Ed did an extraordinary job of rallying the community getting them first of all to accept the concept and then even more important to roll up their sleeves and contribute to it. As a plan I thought it was important and it set priorities. And one of the examples I'd like to give over the years that it also identified some areas where the research portfolio was substantial already and therefore the burden of proof would be that much higher to continue investment in an area that was already well-mined so-to-speak, as opposed to others. And I remember that early first version of the plan the contrasting between the opportunities around the retinal pigment epithelium, which probably would have matured anyway but the process made it come together a lot quicker than it otherwise would have. But to me the real important development was the statement in the plan and reinforced many times by you and others representing the plan that, in the area of the biophysics and visual pigment, NEI already had a substantial portfolio and although it was not closing the door and first class science would be supported but encouraging people to think twice and maybe three times before sending yet another graduate student down that path when there were so many equally important if not more important and un-mined scientific opportunities. And to me that was the most important part was the planning process—of getting the community to step back and look at it that way.

Dr. Kupfer: Yes, that was something that stuck in my mind and of course Ken Brown was very instrumental in refocusing us on the pigment epithelium because suddenly the ability to do recording with micro-electrodes from pigment epithelium opened up and that made some potential understanding of what the RP was doing.

Dr. Raub: The other thing— and I've told this story about many times since in other contexts is when it came to the part of the program when the sensory and other disorders of vision. You may recall that Max Cowan led the first effort on it. And I like Max very much but I was concerned when a basic scientist like Max might not throw himself completely into this task and I was really wrong about that. Because his intellectual approach was to say these disorders are such that a surgical intervention may be near impossible or something very selective at best. And unless we have some kind of pharmacological intervention, beyond that, some means to prevent we would never really be able to deal with these satisfactorily,and the knowledge base we need for a pharmacological intervention or preventive intervention gets into some very fundamental questions in neural science. And so he not only brought this interest in neural science but he brought it in a highly focused way and I thought it was very prominent and important part of the planning effort.

Dr. Kupfer: It certainly was. Right. So you were involved in this strategic program planning even though you came in '75 just at the time this was being brought in.

Dr. Raub: At that time I was more involved in its implementation while there were successive updates of it. I believe that I was involved in at least the first update of it before moving on. And being responsible for the Extramural Programs here one of my major priorities was to take the elements of the plan to try and use it to shape the priorities of the Extramural Program. So I thought I lived with the plan even if I only came in at the tail-end of creating it.

Dr. Kupfer: Right. Before I forget I think you appreciate one of the most wonderful things that occurred in our interview was when you told me about the PROPHET computer project (chuckles). From someone from Extramural to be interested in science, isn't that great? And you worked with Elvin Kabat. What was the outcome of that? Were research papers published?

Dr. Raub: Yes, there were several outcomes and the work with Elvin Kabat was a succession of papers analyzing some structural insights into antibodies. Elvin in particular was able to use the data base to create and manage to identify certain binding properties in the first hyper variable region of immunoglobulins that heretofore had not been identified. He knew because of his wealth of knowledge that they were specific to phosphorylcholine-binding myeloma proteins and that opened up a whole set of insights around the characteristics of the hyper-variable regions where they are the heart of antibody specificity. Subsequent to that the work was instrumentally in his papers and in related work in MIT in understanding how the genes—the code for the hyper-variable regions actually re-assort well after birth. And during the early stages of human development there's a re-assortment of those genes unlike virtually any others in that part of systems. PROHPET didn't create those ideas for him but it gave him a set of tools to look at science in a way that he never had before.

Dr. Kupfer: When you say the PROPHET SYSTEM, was that developed by some other organization?

Dr. Raub: We had two contractors involved. It was basically an idea that I had pursued from the late '60s when I was then with the Division of Research Facilities and Resources (DRFR), but it was of a magnitude that a single individual couldn't do. And so, early on, with the support from the leadership of the then DRFR, I had some contract funds and was able to engage first Bolt, Beranek, & Newman, Inc. in Cambridge, MA and then a second organization called First Data Corporation. Bolt, Beranek, & Newman developed the software and First Data Corporation housed and ran the hardware that we had furnished it and provided the services to what became a growing array of institutions, primarily academic institutions. We had terminal here and then we had one in Jin Kinoshita's laboratory.

Dr. Kupfer: That was in your office.

Dr. Raub: Yes in my office and then others got interested in it. Subsequently we had another installation in Building 6. Now PROPHET has gone on to make its way in the world.

Dr. Kupfer: Really?

Dr. Raub: Bolt, Beranek, & Newman made a commercial spin-off of it under the name of RS-1 and it became a stand-alone data management system in the pharmaceutical and chemical industries.

Dr. Kupfer: Great.

Dr. Raub: After I left it the Division of Research Facilities Resources continued it for quite a while as a national resource for pharmacology research.

Dr. Kupfer: When did your involvement with PROPHET phase out?

Dr. Raub: I phased it out when I left here because, while you were kind enough to allow me to accommodate what was essentially a non-NEI program within the activities here, it was not competing in a priority sense. But when I moved to the NIH front office and had some responsibilities for the Extramural Programs generally, I thought it would be very awkward for me to be operating and be a special advocate for one program while I was dealing with ALL the others and so I made my peace with it at that point and stepped aside.

Dr. Kupfer: Right.

Dr. Raub: It was a first love very much and I missed it.

Dr. Kupfer: We always wondered what other institutes were doing in the way of program planning . Do you have any feel for that other than cancer of course. Cancer to me is best epitomized by the program person there, I forget his name. He said you want plans? You just tell me how much money we're talking about and I'll give you a plan that fits it (laughter). I wish I could remember the name.

Dr. Raub: I can see his face.

Dr. Kupfer: Yeah, that's right.

Dr. Raub: Well, from my vantage point then in the Office of the NIH Director, I think it's fair to say that every one of the institutes began to engage in a formal planning process. I say formal because I would give them all credit. They all tried to have some objectives and priorities but increasingly made it formal where there was a visible document or some visible process. To my taste, while all of that was useful, very few went as far or as focused as the NEI did in terms of normal intensity of the engagement with the community with commitment to keep it upgraded but also translating it into the actual priorities of the program. And if there were differences I saw quite a spectrum of that when I was in the front office as to how tightly some institutes link their plans and how others did not.

Dr. Kupfer: Right. Okay. What stood out to you in the Extramural Programs of the NEI? You must have been involved in all the Extramural Programs at the NIH.

Dr. Raub: Well, first of all, in the NEI, the five program structure which you had served better than I might have even realized at the time because it was a natural enough grouping that the scientists in the field were comfortable with it. So I rarely if ever saw anybody with a sense of artificiality that was part of the cataract program but I think my work has some other focus. It felt well to them and as a result I think it gave NEI the ability to accommodate the genuine investigator-initiated peer-reviewed basic science in a comfortable way. And it also made the community a little more understanding as to when program priorities were delayed on that it was not artificial but rather had a conceptual structure too. So in many ways that made my job easier in directing and coordinating the Extramural Programs. Having that kind of going in acceptance from the community. And beyond that was the ability that NEI had with the tightly knit community to look at other things. You in particular had identified clinical trials as an area that was crying out for investment, and yet many ophthalmologists at the time—certainly in the mid '70s—were not at all poised to be able to do that. I recall you and Matt Davis using the diabetic retinopathy study as a teaching vehicle; but you may recall that we started to see applications come in on other topics that had Xeroxed pages out of the manual of operations of the diabetic retinopathy study. So they were responding to you but in an inadequate way to get through peer review. With your approval, you recall, we created a new device which was essentially a planning grant—we didn't call it that—but it was a small award with typically six months at a time that would take a good idea and a good person and give them the opportunity to ripen it as manifested in a well thought-out manual of operations, if they needed to be consistent with biostatisticians and the design. And virtually every one of those matured into a quite substantial grant application that then the Advisory Council as well as the study sections were comfortable in funding it. And that was a type of flexibility in the Extramural Program that the other institutes had difficulty matching.

Dr. Kupfer: Yes, as far as I'm concerned the diabetic retinopathy study was one of the first outcomes of the program planning that said we just need to do this. How did you view the role at Council at NEI as compared to NIH in following that—what was your opinion of the policy of clinical research centers and emphasis on R01?

Dr. Raub: I've always had a special fondness for the NEI Council because I thought they were good people, strongly committed and I thoroughly enjoyed having interaction with them. As NIH Deputy I had interacted with all the Councils but not quite the same way, it was more of an arm's length thing, in general I was always impressed because they were serious about what they were doing, clearly committed to the institute and the program with which they were associated and provided a very important buffer for the NIH. As I said I had a special fondness for the NEI Council because it took so seriously what we were about. It made major contributions to the program planning effort. A story I've told often is what I viewed as one of the finest hours of the NEI Council was when Dr. Maumenee was serving on it. A clinical trial application came in that requested a very large amount of money. And I remember Dr. Maumenee leading the discussion and saying these are wonderful people and this is an important question but why does it cost so much money. And one of the NEI statisticians, I believe it was Dan Segal at the time, stood up at the side of the room and explained that for the difference that was being sought between the intervention group and the control group a certain sample size was needed and given that sample size the cost came from it. I remember Maumenee reflecting and saying if the difference is only that much it's not worth not teaching our residents. If the difference were 50%, that would be worth investing in educational programs. Would that make a difference? And Dan said it most certainly would and Dan did the calculations and the budget dropped by about two thirds. So the Council recommended approval at the more core sample size than the one managed in the budget, and I thought it was a great instance of the Council exercising for the program relevance in the larger context of science and in this case keeping good people at a good institution moving forward but in a more realistic way in terms of the graduate education in ophthalmology. So I thought that was a good example and I've used it many times.

Dr. Kupfer: Did the Council act in any unusual way compared to other Councils? We've had a number of people commenting on that.

Dr. Raub: To me there was the intensity of their engagement, and they were quite serious not just as advocates for their part of the field but I think almost to a person embraced the larger ideal of the institute, why it was important, what you were trying to do, what the planning process was about. That didn't mean they had to agree on everything. In fact in some ways it was more interesting when they didn't and the product was often better when those differences got resolved in some kind of synthesis. But I didn't necessarily see that same intensity or the same focus all the time in the other Councils. Not that they weren't good people and not that they weren't committed, but it didn't have the same community of interest and feeling of élan about the cause in which they were serving.

Dr. Kupfer: Clinical research centers, that was in perhaps… .

Dr. Raub: If I look at them across the NIH, again there's been quite a heterogeneous set of activities and set of results. It always seemed to me that it was a necessary tool because of some of the sociological factors in science. Many people who were quite respectable clinicians had not had research training and very little opportunity to do it. And to the extent that a clinical research center existed, for many young physicians this was the only opportunity they might have had to engage without a significant career departure. Some of the more motivated ones didn't need the clinical center to lower the energy barrier for them but many did. When I first joined NIH the principle investment in the clinical centers was in the general clinical research centers. At that time there was virtually nothing in the way of the tools in molecular biology, so they were mostly observational studies, mostly metabolic studies, and the centers filled the need for research wards where there could be very controlled circumstances with respect to blood sampling other fluid sampling, dietary control and the like. It was very important. But as the science base changed and as the opportunities for outpatient research became evident, then it seemed to me that the early model for the clinical research center was not as robust as it was and there were other ways to attract and support people interested in clinical research. And now, using clinical research distinct from clinical trials is, I think, another of the virtues of the NEI approach. Especially led by the diabetic retinopathy study creating a structure whereby people whose primary interest was clinical medicine but on an intellectual basis who wanted to be engaged in asking and answering questions could do that without a fundamental departure from what they did every day in terms of their clinical setting; whereas clinical research in the sense of more investigator-initiated protocols often required an environment that a single investigator had trouble creating on his or her own. I always tended to favor programs to create some of that structure rather than to have a large collection of scientific projects, some of which could be first class and some of which could be marginal.

Dr. Kupfer: That would be the clinical research…

Dr. Raub: The clinical research center—to me the price of the stability and the entry opportunities were quite uneven across science.

Dr. Kupfer: Right.

Dr. Raub: Clinical centers were very difficult to review and, once started, very difficult to reorient or turn back; so there was a heavy price to pay for what were some worthwhile things. But I always favored the core grant as something that had less of the baggage of the larger clinical center but addressed some of the core elements of giving investigators resources that either they wouldn't be able to justify on their own or resources with capacity that no one investigator could use entirely or expertise of a subculture capability and the like, but they didn't necessary have to master it and so they created or collaborative and achieved other opportunities.

Dr. Kupfer: Did you originate this concept to the core?

Dr. Raub: No, I think it was here when it came but I was an advocate of its expansion. I think it did grow while I was here. I can't take any particular credit for that other than being a spokesman for it and a champion.

Dr. Kupfer: Well, I have the R01 down as an example, and the reason I'm doing that is that I think the R01, from my point of view, was extremely valuable in the early development of the NEI but in other interviews people feel that research is so complicated now and requires so many people focusing on the problem that the R01 may be limited in some situations and that you really need a larger group of people. My answer has always been, well let's have a collection of R01s and that was good because the last thing in the world we wanted was to get involved in these program projects.

Dr. Raub: I share that. I always did —while I was here and I was in the NIH front office. I was always an advocate for the R01, because if there' s any single thing that's made NIH great, that's its ability to attract and tap into these ideas and to run them through a quality filter with the national competition and direct that energy. And as important as I feel it is, it was necessary but it wasn't sufficient and so it needed to be buttressed by other means whether it was promoting clinical trials in an organized fashion or the core grants that I always thought were a means to create a platform upon which somebody's collaborations could occur spontaneously within the community, perhaps each investigator with an R01, rather than packaging it as a program project or packaging it as a clinical research thing.

Dr. Kupfer: Yes, yes. Now going back to a point you made and I want to be sure I understood it. And that is that you made a distinction between clinical research and clinical trials. Could you elaborate on that a little further?

Dr. Raub: Well, the distinction I was making is that increasingly, especially with the tools of molecular biology now, there are questions of human biology that can be studied ethically with human beings and not just laboratory animals. And so there's a research protocol, but it is very much investigator-initiated and perhaps involving a team in the sense of the different analytical skills or other technologies that are involved. That not testing and intervention but rather trying to understand something more about nature in this case trying to understand something more about human biology, whether in health or in disease. And so that was the distinction that I was making.

Dr. Kupfer: Suppose I was to say what the clinical trial really offers is a management format which could be used for this type of clinical research. You don't need to have an intervention. But the way the problem is posed, the way data is collected in a uniform way. The integration of multiple sites collecting it the same way and the very rigid statistical analysis all seemed to be in a sense a part of the clinical trial management scheme that could be used for a nonrandomized, non-controlled study that is doing something different.

Dr. Raub: Certainly many of the principles carry over. In fact while I was working with you I participated in a symposium with an international group that Bob Gordon had put together. And a little bit with tongue in cheek I took the principles of clinical trials and the principles of management by objectives and did a side-by-side and showed that many of the concepts about focusing on a priority, identifying a path, gathering the information, writing analysis was very much what the goals of the business world were promoting.

Dr. Kupfer: Were you involved in any international programs? It seemed to me you were.

r. Raub: Only marginally.

Dr. Kupfer: Marginally. Right.

Dr. Raub: I don't recall that I had any significant role in any of the international activities.

Dr. Kupfer: What about the National Eye Health Educational Program?

Dr. Raub: That all came after I was here as well.

Dr. Kupfer: But the question that Ed proposed was how do you view these activities for an NIH institute and why don't all institutes have them?

Dr. Raub: That's a good question. I always viewed it as a quite natural outreach, in many ways the ability to demonstrate the relevance of the institute also to keep the institute focused on whether the important problems, whether they were in the perspective of the clinicians or in perspective of patients. Devices of that sort seem to me valuable to work both ways and the issues always run on balancing the resource investment. Ensuring that sort of outreach is done without so eroding or distracting from the things that make it possible as to be discouraging. So in general I thought it was a good idea. Some programs of the National Heart, Lung and Blood Institute did, if you recall, in related ways.

Dr. Kupfer: Oh yes, they were our models.

Dr. Raub: They put a lot of energy in this some analogous kinds of things. And I believe for the same reasons, both reaping the benefits of research and also getting the stimulus of needs and good opportunities to help shape the research agenda.

Dr. Kupfer: I was very pleased to hear that the NIH Director thought that the education program at the NEI was one of the great assets of the NIH (chuckles). I thought that was great and I agreed with him it was. But all the institutes don't really have a strong program…

Dr. Raub: It's hard to do.

Dr. Kupfer: Yes, it sure is.

Dr. Raub: It takes commitment to do it because it doesn't have the same predictable feeling as the more traditional approaches defending research grants and so there needs to be the will to do it.

Dr. Kupfer: Bill do you have any comments about the Intramural Program of the NEI. I knew you weren't directly involved but looking at it in perspective.

Dr. Raub: No, but I had a lot of individual interactions with the intramural scientists, not only while I was here but even after I was in the NIH front office. I think it captured in its own way why the NIH has an Intramural Program. It created, first of all, stability for some people who could really look at some really deep questions and do it in a predictable way over a period of years. And they all would have thrived, I'm sure, in a university setting and would have done well in getting research project grants but the environment here gave them not only a greater stability about what they were about but, because it was NIH, but also a much richer set of collaborators. That would have been hard to emulate even in some of the major universities. Otherwise it seemed that the institute always kept a clear line on what was special about its intramural program and what was different about it and used it in a strongly complimentary way to the Extramural Program. I recall some of the issues in the clinical trials where there were some things that for a while looked like they might be impossible or impractical to leave to the Extramural world and I remember the staff at the clinical center saying well we think can invest in that. So I just liked the continuity of it and thought that's why NIH had an Intramural Program in general; and I thought NEI took full advantage of it.

Dr. Kupfer: This is just peripheral to that question but as you may recall, the intramural programs began to be reviewed by a committee that the Institute Director between 1995 and 2000.

Dr. Raub: Varmus.

Dr. Kupfer: Varmus.

Dr. Raub: Harold Varmus.

Dr. Kupfer: Yes. He initiated that and one of the major discussions that we had with the committee was how to avoid the position for life that a researcher has and when they are no longer productive, what does one do? And every inch of your program apparently said we have our quota of people who aren't at the cutting edge anymore. And I didn't hear any good suggestions from any of the people we interviewed who brought that up that the Intramural Program at NIH lost its luster in the '60s and '70s when things were really great, i.e. the Vietnam War was on and all the people took their training in Intramural. In fact I think the best training mechanism was the Intramural Program. Do you have any thoughts on that?

Dr. Raub: I think the other thing that I always thought contributed to it is the period that many people refer to as the high point of the Intramural Program in general was a period when the Extramural Programs weren't all that strong. And while they were clearly a number of strong research-oriented universities and medical centers that had long histories of endowment, that's a small number compared to what came to flourish because of the big expansion of the Extramural Program that in turn created the different competitive dynamic. Not only were salaries often better during the period following that in the academic world than here; but, as biotechnology began to emerge, I saw a number of scientists I knew who wanted some form of commercial affiliation ranging from simply being a consultant or a collaborator to actually being a CEO. A number of the universities made that kind of environment possible; but it would have been difficult, then or even now, for NIH to do. I saw it not so much as loss of luster at NIH but as a growing competition that created an array of other opportunities but nevertheless strong people were here for good reason and this was a unique environment. Those who understood it for what it is prefer it.

Dr. Kupfer: That's a very good analysis. Well, the last is there anything you would like to add? Any comments where NEI perhaps fell short in where it might have reached a greater activity in the research field?

Dr. Raub: NEI was always a strong illustration of the need to focus on a particular need, that is, starting out as a medical need that was not necessarily recognized in an earlier NIH structure, giving it visibility, giving it the appropriation structure, putting it in the spotlight and requiring it to perform. And it did. It demonstrated the utility of that categorical purpose. It's easy for me to say now that I'm not at NIH in that the proliferation of institutes created a variety of management headaches., But in fact much of the successes of NIH stem from the categorical focus—not just the money, but the attention. This is what it took. And I thought NEI was always a textbook case of something that was actually created by external forces but, once in place, demonstrated its utility. I thought it was embraced by NIH management as something that was filling that need and brilliantly so.

Dr. Kupfer: How was NEI perceived by Building 1? I always had the feeling that — and it was a natural one—that the main concerns of NIH leadership was these very, very large organizations like the Cancer Institute that had tremendous resources and whether they were really being used appropriately. I don't think many people bothered with us which perhaps was a good thing.

Dr. Raub: No, I think you put your finger on part of it. I mean much of the things that claimed the attention of the NIH leadership when I was in the front office - and before and after—were not only the large investments in some of the very big institutes, but also the expectations for them. Many were seen as the connection to bigger health problems. Now anybody who looks at the statistics for vision problems could be impressed by the economic, if not the mortality and morbidity issues. But I think there was a tendency for the statistics on cancer, or for heart disease, and later, for HIV/AIDS, tend to eclipse many other things, not just the NEI. People didn't always appreciate that some of the questions being pursued that might be germane to the prevention of cataract, let's say, also had broader biological implications. And if there are things that the front office might have missed, I would say they might have been in that category because they weren't coming through all the other activity that was going on with respect to whether the Cancer Institute was investing enough in basic biology or whether the Heart Institute was investing too much in large-scale controlled clinical trials or whether some of those large organized studies on HIV/AIDS were on the right track. And so on.

Dr. Kupfer: Well, that certainly was a nice rundown—I certainly appreciate listening to it.

End of Interview